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09/878,296	06/12/2001	Masakazu Matsugu	35.G2827	3025

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EXAMINER	
BELL, MELTIN	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/878,296	Applicant(s) MATSUGU, MASAKAZU	
	Examiner Meltin Bell	Art Unit 2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 June 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-66* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-66* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 June 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☒ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/878,296.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This action is responsive to application **09/878,296** filed 06/12/01

Claims 1-66 have been examined.

Priority

Applicant is advised of possible benefits under 35 U.S.C. 119(a)-(d), wherein an application for patent filed in the United States may be entitled to the benefit of the filing date of a prior application filed in a foreign country.

Acknowledgment is made of applicant's claim for foreign priority based on applications 181480/2000, 181487/2000 and 181488/2000 filed in Japan on **6/16/00**.

Information Disclosure Statement

Applicant is respectfully reminded of the ongoing Duty to disclose 37 C.F.R. 1.56 all pertinent information and material pertaining to the patentability of applicant's claimed invention, by submitting in a timely manner PTO-1449, Information Disclosure Statement (IDS) with the filing of applicant's application or thereafter.

The information disclosure statement filed 8/1/01 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because of missing or inaccurate information in the listing:

- The Culhane et al reference is missing its date of publication.
- JP 2879670 is not listed.

- The specification mentions the following documents that should be listed on and/or included in an IDS:
    - Japanese Patent Laid-Open No. 5-108804 on page 9, line 5
    - Le Cun et al on page 26, lines 4-7
    - IEEE Transactions on Neural Networks Volume 10 on page 34, line 1
    - Daugman on page 40, lines 21-25
    - Japanese Patent Laid-Open Nos. 5-37317 and 10-327054 on page 52, lines 15-16
    - Izhikevich on page 60, lines 6-8
    - Patent No. 2717662 on page 77, lines 16-17
    - Japanese Patent Laid-Open No. 08-321747
    - Patent Nos. 2941847 and 2763296 on page 77, lines 16-17

It has been placed in the application file. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609 ¶ C(1).

Drawings

The drawings have not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is required in correcting any errors of which applicant may become aware in the drawings.

The drawings are objected to because:

- Fig. 4, item 401 should be labeled 'small synapse circuit' based on page 50, line 24.
- 'plural' should be removed from Fig. 8, step S801, S803 and S805 based on page 69, lines 22 through page 70, line 10.
- 'imaging parameter' should be added to Fig. 11, item 1104's text description based on page 74, lines 16-17.
- Fig. 11, item 1109 should be large enough to fit 'strobe luminescent unit' from page 74, lines 21-22.
- The label for Fig. 4B should be 'small synapse circuit'
- The text and numeric layout for Fig. 18, item 1801 should be revised based on page 98, lines 5-6.
- 'feature detection' should be prepended to the text of Fig. 17, item 1701: page 99, lines 19-20; page 100, lines 3-4; page 111, line 25 through page 112, line 1; page 118, line 15.
- 'gate' should be 'gating' in Fig. 19B.
- Fig. 22, item 2201 should be labeled 'time-base population coder' as on page 117, lines 2-3.

- 'gaze' should be replaced with 'fixed' in Fig. 29, item 108's label.
- Item 3101 in Figs. 31 and 32 should be labeled 'gating circuit' as on page 135, line 25 and page 144, line 1.
- Items 1111 and 3901 in Fig. 39 don't agree with page 165, lines 12-13. Changing 1111 to 1101 may fix the issue.
- Page 166, lines 16-18 don't agree with Fig. 39.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is required in correcting any errors of which applicant may become aware in the specification.

The disclosure is objected to because of the following informalities:

- The 'synapse circuit S 202' of page 29, line 20 should be 'synapse circuit S_K 202 or S_i 202'.
- The 'feature detection layers 103' on page 31, line 45 should be 'feature detection layers 102' or 'feature integration layers 103'.
- '102' should follow 'feature detection layer': page 33, line 1; page 39, lines 14 and 24-25; page 83, line 3; page 112, line 2; page 118, lines 2 and 14; page 125, lines 1-2; page 125, line 6; page 126, lines 2 and 8; etc.

- '103' should follow 'feature integration layer': page 83, line 4; page 90, lines 4-5; page 125, lines 18 and 25; page 126, lines 9-10; etc.
- 'synapse' should be inserted between 'small' and 'circuits' on page 50, line 7.
- '401' on page 53, line 8 should be '301'.
- 'amount' should be removed from page 54, line 7.
- ', respectively' should be added after S804 on page 70, line 3.
- ', respectively' should be added after S806 on page 70, line 4.
- 'processing' should be detection on page 71, line 8.
- 'synapse element' should be 'small synapse circuit' on page 77, lines 11-12 and line 21
- 'connection element' should be removed from page 99, line 15.
- 'degree' should be inserted between 'activation' and 'control' on page 101, line 17.
- '1603' should be '1903' on page 101, line 20.
- '1604' should be '1904' on page 101, line 21.
- 'fixation' should be 'attention' on page 136, lines 4-5.
- 'circuit' should follow 'synapse' on page 139, line 25 and page 140, line 3.
- '1906' should be '3006' on page 144, line 11.
- 'semi' should be 'quasi' on page 150, line 1.
- '3901' should be '3902' on page 167, line 3 based on Fig. 39.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 66 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The language of the claims (e.g. "pattern", "signal", "features") raise a question as to whether the claims are directed merely to an abstract idea that is not tied to a technological art, environment or machine which would result in a practical application producing a concrete, useful, and tangible result to form the basis of statutory subject matter under 35 U.S.C. 101. For example, if claim 66 was amended to recite a computer-implemented method, it will be statutory in most cases since use of technology permits the function of the descriptive material to be realized.

Claim Rejections - 35 USC § 103

To expedite a complete examination of the instant application, the claims rejected under 35 U.S.C. 101 (nonstatutory) above are further rejected as set forth below in anticipation of applicant amending these claims to place them within the four statutory categories of invention.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-15, 19-24 and 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Fukushima* USPN 5,058,184 (October 15, 1991) in view of *Johnson* USPN 5,664,065 (September 2, 1997) and in further view of *Iwata et al* USPN 6,088,490 (July 11, 2000 Patent Date; March 25, 1998 Filing Date).

Regarding claim 1:

Fukushima teaches,

- input means for inputting a pattern (Fig. 1)

- pattern detecting means that comprises a plurality of signal processing elements and performs detection related to a plurality of predetermined features on a pattern input by the input means so as to detect a predetermined pattern included in the pattern (column 4, lines 58-68, "the neural network...single line showing"; column 5, lines 1-22, "the existence of...in FIG. 2")

- wherein each of the plurality of signal processing elements outputs a signal to another signal processing element or outside in response to an input from the input means or another signal processing element (Figs. 7-14)

- predetermined ones among the plurality of signal processing elements output signals with outputs based on arrival time patterns of a plurality of signals (column 25, lines 34-68, 'FIGS. 16-18 show the...new response thus'; column 26, lines 1-6, 'elicited is shown...of "2" appears")

However, *Fukushima* doesn't explicitly teach outputting a pulse signal or a plurality of pulse signals input within a predetermined time range while *Johnson* teaches,

- wherein each of the plurality of signal processing elements outputs a pulse signal to another signal processing element or outside in response to an input from the input means or another signal processing element (Abstract, "The pulse-coupled automatic...to the segment"; Fig. 1)

Iwata et al teaches,

- predetermined ones among the plurality of signal processing elements output pulse signals with outputs based on arrival time patterns of a plurality of pulse signals input within a predetermined time range (Figs. 1A, 2A, 8B, 9-10, 13A-B; column 13, lines 42-52, "The dynamic range...from easily degrading"; column 6, lines 22-45, "FIG. 7 shows an...high relative accuracy")

Motivation - The portions of the claimed apparatus would have been a highly desirable feature in this art for

- High performance image processing (*Iwata et al*, column 1, lines 62-67, "To solve the...as an image"; column 2, lines 1-5, "figure, etc., compression...images, figures, etc.")
- Reducing transmission in cluttered environments (*Johnson*, column 2, lines 23-58, "the receptive field...in the scene")
- Overcoming noise as well as changes in shape, size and position of the input pattern (*Fukushima*, column 2, lines 12-42, "On the other...a segmentation faculty")

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Fukushima* with *Johnson* and *Iwata et al* to obtain the invention specified in claim 1, a pattern detecting apparatus. The modification would have been obvious because one of ordinary skill in the art would have been motivated to efficiently relate specific patterns in various processing and input environments.

Regarding claim 2:

The rejection of claim 1 is incorporated. Claim 2's further limitations are taught in *Fukushima*:

- the plurality of signal processing elements comprises:

- a feature detection element that belongs to a feature detection layer for extracting a predetermined feature, and a feature integration element that belongs to a feature integration layer that integrates outputs from the feature detection layer according to a predetermined method and outputs a result of the integration (Fig. 1)

- the predetermined ones among the plurality of signal processing elements are the feature detection elements that receive inputs from a plurality of the feature integration elements (Figs. 7-12)

Therefore, claim 2 is rejected under the same rationale as claim 1.

Regarding claim 3:

The rejection of claim 2 is incorporated. Therefore, claim 3 is rejected under the same rationale as claim 2.

Regarding claim 4:

The rejection of claim 2 is incorporated. Therefore, claim 4 is rejected under the same rationale as claim 2.

Regarding claim 5:

The rejection of claim 2 is incorporated. Therefore, claim 5 is rejected under the same rationale as claim 2.

Regarding claim 6:

The rejection of claim 5 is incorporated. Claim 6's further limitations are taught in *Fukushima*:

- wherein each of the feature integration elements of the feature integration layers has a local receptive field structure for receiving the signals from a plurality of feature detection elements which exist in a local range in a feature detection layer of a preceding stage and which individually detect an identical feature (column 16, lines 66-68, "At each stage...is used to"; column 17, lines 1-42, "denote the layer...usually still responds"; column 24, lines 25-39, "The influence of...more features simultaneously") Therefore, claim 6 is rejected under the same rationale as claim 5.

Regarding claim 7:

The rejection of claim 5 is incorporated. Claim 7's further limitations are taught in *Fukushima*:

- wherein feature detection elements of the feature detection layer receive signals from feature integration elements associated with different features in a feature integration layer in the preceding stage to detect a higher-order feature (column 16, lines 66-68, "At

each stage...is used to"; column 17, lines 1-42, "denote the layer...usually still responds"; column 24, lines 25-39, "The influence of...more features simultaneously")

Therefore, claim 7 is rejected under the same rationale as claim 5.

Regarding claim 8:

The rejection of claim 2 is incorporated. Claim 8's further limitations are taught in *Johnson*:

- wherein at least some of the feature detection layers comprise a plurality of filters for performing a local spatial frequency analysis related to a component in a predetermined direction (column 4, lines 10-20, "The present invention...numbers of edges"; column 7, lines 24-45, "FIG. 9 is a...a parallel manner")

Therefore, claim 8 is rejected under the same rationale as claim 2.

Regarding claim 9:

The rejection of claim 2 is incorporated. Claim 9's further limitations are taught in *Fukushima*:

- wherein the plurality of feature detection elements existing in the same receptive field of the feature integration elements output pulses for a predetermined pattern (column 16, lines 66-68, "At each stage...is used to"; column 17, lines 1-42, "denote the layer...usually still responds"; column 24, lines 25-39, "The influence of...more features simultaneously")

Johnson:

- wherein the plurality of feature detection elements output pulses in phase-synchronization with each other for a predetermined pattern (column 3, lines 31-59, 'While the pulse...from "1" to "0"')

Therefore, claim 9 is rejected under the same rationale as claim 2.

Regarding claim 10:

The rejection of claim 2 is incorporated. Therefore, claim 10 is rejected under the same rationale as claim 2.

Regarding claim 11:

The rejection of claim 2 is incorporated. Claim 11's further limitations are taught in *Fukushima*:

- wherein the feature detection layer comprises timing elements appendant to the feature detection elements in the layer, and the timing elements output pulses at predetermined pulse intervals to issue signals of the phase synchronization for feature detection calculating elements on the basis of the output from the feature integration elements on the same receptive field of a layer in the preceding stage (column 16, lines 66-68, "At each stage...is used to"; column 17, lines 1-42, "denote the layer...usually still responds"; column 24, lines 25-39, "The influence of...more features simultaneously")

Therefore, claim 11 is rejected under the same rationale as claim 2.

Regarding claim 12:

The rejection of claim 11 is incorporated. Therefore, claim 12 is rejected under the same rationale as claim 11.

Regarding claim 13:

The rejection of claim 2 is incorporated. Therefore, claim 13 is rejected under the same rationale as claim 2.

Regarding claim 14:

The rejection of claim 2 is incorporated. Therefore, claim 14 is rejected under the same rationale as claim 2.

Regarding claim 15:

The rejection of claim 1 is incorporated. Claim 15's further limitations are taught in *Iwata et al*:

- wherein the plurality of signal processing elements are connected through the intermediary of connecting means, and the connecting means carries out predetermined modulation on an output pulse signal of one of the signal processing elements and transmits the modulated output pulse signal to the other of the signal processing elements (Abstract, "A two-dimensional information...by the detector")

Therefore, claim 15 is rejected under the same rationale as claim 1.

Regarding claim 19:

The rejection of claim 15 is incorporated. Therefore, claim 19 is rejected under the same rationale as claim 15.

Regarding claim 20:

The rejection of claim 1 is incorporated. Claim 20's further limitations are taught in *Johnson*:

- wherein the predetermined ones among the plurality of signal processing elements output pulse signals at output levels based on the weighted sum obtained by multiplying a plurality of pulse signals received within the predetermined time range by predetermined weighting coefficient values, which temporally change, and adding the results (column 2, lines 9-21, "Receptive Field Structures...given spatial region")

Therefore, claim 20 is rejected under the same rationale as claim 1.

Regarding claim 21:

The rejection of claim 1 is incorporated. Therefore, claim 21 is rejected under the same rationale as claim 1.

Regarding claim 22:

The rejection of claim 1 is incorporated. Therefore, claim 22 is rejected under the same rationale as claim 1.

Regarding claim 23:

The rejection of claim 2 is incorporated. Claim 23's further limitations are taught in *Johnson*:

- a feature position detection layer that receives an output from the feature integration layer and outputs information regarding the position where a predetermined feature or pattern exists (column 4, lines 10-20, "The present invention...numbers of edges"; column 7, lines 24-45, "FIG. 9 is a...a parallel manner")

Fukushima:

- a feature position detection layer that receives an output from the feature integration layer and outputs information regarding the position where a predetermined feature or pattern exists (column 17, lines 37-42, "On the other...usually still responds")

Therefore, claim 23 is rejected under the same rationale as claim 2.

Regarding claim 24:

The rejection of claim 23 is incorporated. Therefore, claim 24 is rejected under the same rationale as claim 23.

Regarding claim 66:

Fukushima teaches,

- receiving a pattern from an input section (Fig. 1)
- subjecting the received pattern to detection on a predetermined plurality of features thereby to detect a predetermined pattern included in the pattern by employing a plurality of signal processing elements (column 4, lines 58-68, "the neural network...single line showing"; column 5, lines 1-22, "the existence of...in FIG. 2")
- wherein the step of subjecting the received pattern to detection includes the steps of
- outputting a signal to another signal processing element or outside from each of the plurality of signal processing elements in response to an input from the input section or another signal processing element (Figs. 7-14)
- outputting signals, from predetermined ones among the plurality of signal processing elements, at output levels based on arrival time patterns of a plurality of signals (column 25, lines 34-68, 'FIGS. 16-18 show the...new response thus'; column 26, lines 1-6, 'elicited is shown...of "2" appears")

However, *Fukushima* doesn't explicitly teach outputting a pulse signal or a plurality of pulse signals input within a predetermined time range while *Johnson* teaches,

- outputting a pulse signal to another signal processing element or outside from each of the plurality of signal processing elements in response to an input from the input section or another signal processing element (Abstract, "The pulse-coupled automatic...to the segment"; Fig. 1)

Iwata et al teaches,

- outputting pulse signals, from predetermined ones among the plurality of signal processing elements, at output levels based on arrival time patterns of a plurality of pulse signals input within a predetermined time range (Figs. 1A, 2A, 8B, 9-10, 13A-B; column 13, lines 42-52, "The dynamic range...from easily degrading"; column 6, lines 22-45, "FIG. 7 shows an...high relative accuracy")

Motivation - The portions of the claimed method would have been a highly desirable feature in this art for

- High performance image processing (*Iwata et al*, column 1, lines 62-67, "To solve the...as an image"; column 2, lines 1-5, "figure, etc., compression...images, figures, etc.")
- Reducing transmission in cluttered environments (*Johnson*, column 2, lines 23-58, "the receptive field...in the scene")
- Overcoming noise as well as changes in shape, size and position of the input pattern (*Fukushima*, column 2, lines 12-42, "On the other...a segmentation faculty")

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Fukushima* with *Johnson* and *Iwata et al* to obtain the invention specified in claim 66, a pattern detecting method. The modification would have been obvious because one of ordinary skill in the art would have been motivated to efficiently relate specific patterns in various processing and input environments.

Claims 16-18, 25-36 and 41-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Fukushima* USPN 5,058,184 (October 15, 1991) in view of *Johnson* USPN 5,664,065 (September 2, 1997) in further view of *Iwata et al* USPN 6,088,490 (July 11, 2000 Patent Date; March 25, 1998 Filing Date) and in further view of *Richards et al* USPN 6,178,207 (January 23, 2001 Patent Date; January 9, 1998 Filing Date).

Regarding claim 16:

Fukushima teaches,

- input means for inputting a pattern (Fig. 1)

- pattern detecting means that comprises a plurality of signal processing elements and performs detection related to a plurality of predetermined features on a pattern input by the input means so as to detect a predetermined pattern included in the pattern (column 4, lines 58-68, "the neural network...single line showing"; column 5, lines 1-22, "the existence of...in FIG. 2")

- wherein each of the plurality of signal processing elements outputs a signal to another signal processing element or outside in response to an input from the input means or another signal processing element (Figs. 7-14)

- predetermined ones among the plurality of signal processing elements output signals with outputs based on arrival time patterns of a plurality of signals (column 25, lines 34-68, 'FIGS. 16-18 show the...new response thus'; column 26, lines 1-6, 'elicited is shown...of "2" appears")

However, *Fukushima* doesn't explicitly teach outputting a pulse signal, a plurality of pulse signals input within a predetermined time range or wherein the modulation is implemented to delay a pulse phase while *Johnson* teaches,

- wherein each of the plurality of signal processing elements outputs a pulse signal to another signal processing element or outside in response to an input from the input means or another signal processing element (Abstract, "The pulse-coupled automatic...to the segment"; Fig. 1)

Iwata et al teaches,

- predetermined ones among the plurality of signal processing elements output pulse signals with outputs based on arrival time patterns of a plurality of pulse signals input within a predetermined time range (Figs. 1A, 2A, 8B, 9-10, 13A-B; column 13, lines 42-52, "The dynamic range...from easily degrading"; column 6, lines 22-45, "FIG. 7 shows an...high relative accuracy")

- wherein the plurality of signal processing elements are connected through the intermediary of connecting means, and the connecting means carries out predetermined modulation on an output pulse signal of one of the signal processing elements and transmits the modulated output pulse signal to the other of the signal processing elements (Abstract, "A two-dimensional information...by the detector")

Richards et al teaches,

- wherein the modulation is implemented to delay a pulse phase (column 17, lines 49-67, "the vector summer adds...information. For example"; column 18, lines 1-19, "delays might be...pulse position modulation")

Motivation - The portions of the claimed apparatus would have been a highly desirable feature in this art for

- Accurate detection with flexible data rates (*Richards et al,* Abstract, "An ASIC chip...aircraft operational environment")
- High performance image processing (*Iwata et al*, column 1, lines 62-67, "To solve the...as an image"; column 2, lines 1-5, "figure, etc., compression...images, figures, etc.")
- Reducing transmission in cluttered environments (*Johnson*, column 2, lines 23-58, "the receptive field...in the scene")
- Overcoming noise as well as changes in shape, size and position of the input pattern (*Fukushima*, column 2, lines 12-42, "On the other...a segmentation faculty")

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Fukushima* with *Johnson, Iwata et al* and *Richards et al* to obtain the invention specified in claim 16, a pattern detecting apparatus. The modification would have been obvious because one of ordinary skill in the art would have been motivated to efficiently and correctly relate specific patterns in various processing and input environments.

Regarding claim 17:

The rejection of claim 16 is incorporated. Therefore, claim 17 is rejected under the same rationale as claim 16.

Regarding claim 18:

The rejection of claim 16 is incorporated. Claim 18's further limitations are taught in *Richards et al*:

- wherein the delay amount of the pulse phase remains substantially constant regardless of the type of a feature (column 21, lines 39-46, "Integration begins either...of inertial measurements")

Therefore, claim 18 is rejected under the same rationale as claim 16.

Regarding claim 25:

Fukushima teaches,

- input means for inputting a pattern (Fig. 1)

- pattern detecting means that comprises a plurality of signal processing elements and performs detection related to a plurality of predetermined features on a pattern input by the input means so as to detect a predetermined pattern included in the pattern (column 4, lines 58-68, "the neural network...single line showing"; column 5, lines 1-22, "the existence of...in FIG. 2")

- wherein each of the plurality of signal processing elements outputs a signal to another signal processing element or outside in response to an input from the input means or another signal processing element (Figs. 7-14)

- predetermined ones among the plurality of signal processing elements output signals with outputs based on arrival time patterns of a plurality of signals (column 25, lines 34-68, 'FIGS. 16-18 show the...new response thus'; column 26, lines 1-6, 'elicited is shown...of "2" appears")

- the pattern detecting means has a plurality of processing layers composed of a plurality of neuron elements arranged in parallel as the signal processing elements, the neuron elements receiving a plurality of signals and outputting pulse signals (Abstract, "Plural efferent signal...the input pattern")

However, *Fukushima* doesn't explicitly teach outputting a pulse signal, a plurality of pulse signals input within a predetermined time range or the synaptic connection means imparts a specific phase shift amount to the pulse signals output from the plurality of neuron elements while *Johnson* teaches,

- wherein each of the plurality of signal processing elements outputs a pulse signal to another signal processing element or outside in response to an input from the input means or another signal processing element (Abstract, "The pulse-coupled automatic...to the segment"; Fig. 1)

Iwata et al teaches,

- predetermined ones among the plurality of signal processing elements output pulse signals with outputs based on arrival time patterns of a plurality of pulse signals input within a predetermined time range (Figs. 1A, 2A, 8B, 9-10, 13A-B; column 13, lines 42-52, "The dynamic range...from easily degrading"; column 6, lines 22-45, "FIG. 7 shows an...high relative accuracy")

- the pulse signals output from a plurality of neuron elements of another layer to at least one of the neuron elements of a predetermined one of the processing layers are input through the intermediary of a bus line common to synaptic connection means provided for each of the plurality of neuron elements, and to the plurality of neuron elements (Abstract, "A two-dimensional information...by the detector")

Richards et al teaches,

- the synaptic connection means imparts a specific pulse phase shift amount to the pulse signals output from the plurality of neuron elements (column 22, lines 13-49, "the transmit path...and PPM waveforms")

Motivation - The portions of the claimed apparatus would have been a highly desirable feature in this art for

- Accurate detection with flexible data rates (*Richards et al,* Abstract, "An ASIC chip...aircraft operational environment")
- High performance image processing (*Iwata et al*, column 1, lines 62-67, "To solve the...as an image"; column 2, lines 1-5, "figure, etc., compression...images, figures, etc.")
- Reducing transmission in cluttered environments (*Johnson*, column 2, lines 23-58, "the receptive field...in the scene")
- Overcoming noise as well as changes in shape, size and position of the input pattern (*Fukushima*, column 2, lines 12-42, "On the other...a segmentation faculty")

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Fukushima* with *Johnson, Iwata et al* and *Richards et al* to obtain the invention specified in claim 25, a pattern detecting apparatus. The modification would have been obvious because one of ordinary skill in the art would have been motivated to efficiently and correctly relate specific patterns in various processing and input environments.

Regarding claim 26:

Fukushima teaches,

- input means for inputting a pattern (Fig. 1)

- pattern detecting means that comprises a plurality of signal processing elements and performs detection related to a plurality of predetermined features on a pattern input by the input means so as to detect a predetermined pattern included in the pattern (column 4, lines 58-68, "the neural network...single line showing"; column 5, lines 1-22, "the existence of...in FIG. 2")

- wherein each of the plurality of signal processing elements outputs a signal to another signal processing element or outside in response to an input from the input means or another signal processing element (Figs. 7-14)

- predetermined ones among the plurality of signal processing elements output signals with outputs based on arrival time patterns of a plurality of signals (column 25, lines 34-68, 'FIGS. 16-18 show the...new response thus'; column 26, lines 1-6, 'elicited is shown...of "2" appears")

- the pattern detecting means comprises:

- a plurality of processing means for implementing processing for different resolutions or scale levels on patterns received from the input means (column 25, lines 16-18, "We will now...network is L = 3")

However, *Fukushima* doesn't explicitly teach outputting a pulse signal, a plurality of pulse signals input within a predetermined time range, processing at different scale levels or resolutions or multiplex processing while *Johnson* teaches,

- wherein each of the plurality of signal processing elements outputs a pulse signal to another signal processing element or outside in response to an input from the input means or another signal processing element (Abstract, "The pulse-coupled automatic...to the segment"; Fig. 1)

Iwata et al teaches,

- predetermined ones among the plurality of signal processing elements output pulse signals with outputs based on arrival time patterns of a plurality of pulse signals input within a predetermined time range (Figs. 1A, 2A, 8B, 9-10, 13A-B; column 13, lines 42-52, "The dynamic range...from easily degrading"; column 6, lines 22-45, "FIG. 7 shows an...high relative accuracy")

Richards et al teaches,

- the pattern detecting means comprises:

- a plurality of processing means for implementing processing for different resolutions or scale levels on patterns received from the input means (column 14, lines 11-60, "The high data rate...time of arrival")

- multiplex processing means for coupling the outputs of the plurality of processing means (Fig. 11, item 1118)

- wherein each of the plurality of processing means comprises a plurality of feature detection elements, as the signal processing elements, that detect and output a plurality of features associated with individual points obtained by sampling the input data according to a predetermined method (column 22, lines 13-49, "the transmit path...and PPM waveforms")

- the multiplex processing means couples the outputs of the plurality of feature detection elements (Fig. 18, items 414, 1830, 1832)

Motivation - The portions of the claimed apparatus would have been a highly desirable feature in this art for

- Accurate detection with flexible data rates (*Richards et al,* Abstract, "An ASIC chip...aircraft operational environment")
- High performance image processing (*Iwata et al*, column 1, lines 62-67, "To solve the...as an image"; column 2, lines 1-5, "figure, etc., compression...images, figures, etc.")
- Reducing transmission in cluttered environments (*Johnson*, column 2, lines 23-58, "the receptive field...in the scene")
- Overcoming noise as well as changes in shape, size and position of the input pattern (*Fukushima*, column 2, lines 12-42, "On the other...a segmentation faculty")

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Fukushima* with *Johnson, Iwata et al* and *Richards et al* to obtain the invention specified in claim 26, a pattern detecting apparatus. The modification would have been obvious because one of ordinary skill in the art would have been motivated to efficiently and correctly relate specific patterns in various processing and input environments.

Regarding claim 27:

The rejection of claim 26 is incorporated. Claim 27's further limitations are taught in *Fukushima*:

- the plurality of processing means make up a hierarchical network structure (Title, "Hierarchical Information Processing System")

Richards et al:

- the multiplex processing means selects a resolution or scale level, or makes setting for coupling processed outputs of a plurality of resolutions or scale levels on the basis of a predetermined plurality of outputs among the outputs of the feature detection elements that correspond to the processing results in respective intermediate hierarchies of the processing means for a plurality of resolutions or scale levels (column 23, lines 43-67, "Timing Adjustment of...faster system clock"; column 24, lines 1-44, "In contrast, with...the system clock")

Therefore, claim 27 is rejected under the same rationale as claim 26.

Regarding claim 28:

The rejection of claim 27 is incorporated. Therefore, claim 28 is rejected under the same rationale as claim 27.

Regarding claim 29:

The rejection of claim 27 is incorporated. Therefore, claim 29 is rejected under the same rationale as claim 27.

Regarding claim 30:

The rejection of claim 26 is incorporated. Claim 30's further limitations are taught in *Richards et al*:

- wherein each of the plurality of processing means comprises a plurality of hierarchical processing layers, and the multiplex processing means refers to intermediate processing results at processing layers of different hierarchical levels thereby to select a resolution or scale level (column 23, lines 43-67, "Timing Adjustment of...faster system clock"; column 24, lines 1-44, "In contrast, with...the system clock")

Therefore, claim 30 is rejected under the same rationale as claim 26.

Regarding claim 31:

The rejection of claim 29 is incorporated. Therefore, claim 31 is rejected under the same rationale as claim 29.

Regarding claim 32:

The rejection of claim 26 is incorporated. Claim 32's further limitations are taught in *Fukushima*:

- wherein the plurality of processing means have feature detection layers for detecting features of a predetermined plurality of feature categories (column 5, lines 57-66, "an output response...the input cell-layer")

Richards et al

- wherein the plurality of processing means have feature detection layers for detecting features at different resolutions or scale levels on each of a predetermined plurality of feature categories (column 23, lines 43-67, "Timing Adjustment of...faster system clock"; column 24, lines 1-44, "In contrast, with...the system clock")

Therefore, claim 32 is rejected under the same rationale as claim 26.

Regarding claim 33:

The rejection of claim 32 is incorporated. Therefore, claim 33 is rejected under the same rationale as claim 32.

Regarding claim 34:

The rejection of claim 32 is incorporated. Claim 34's further limitations are taught in *Johnson*:

- wherein the feature detection layer locally performs spatial filtering for different spatial frequencies (column 1, lines 1-22, "and/or temporal groups...given spatial region")

Therefore, claim 34 is rejected under the same rationale as claim 32.

Regarding claim 35:

The rejection of claim 32 is incorporated. Claim 35's further limitations are taught in *Johnson*:

- wherein each feature detection element of the feature detection layer detects a plurality of features at different resolutions or scale levels in a local, identical region of input data (column 1, lines 1-22, "and/or temporal groups...given spatial region")

Therefore, claim 35 is rejected under the same rationale as claim 32.

Regarding claim 36:

The rejection of claim 32 is incorporated. Therefore, claim 36 is rejected under the same rationale as claim 32.

Regarding claim 41:

The rejection of claim 26 is incorporated. Claim 41's further limitations are taught in *Richards et al*:

- the processing means comprises:

- a plurality of feature detection elements for detecting a plurality of features at individual points obtained by sampling the input data according to a predetermined method (column 25, lines 62-67, "The present invention...aircraft. The demodulator"; column 26, lines 1-31, "permits quicker response...invention is applicable")

- control means that integrates the plurality of the outputs of the feature detection elements of the plurality of processing means at different resolutions or scale levels so as to carry out control related to resolutions or scale levels (Abstract, "An ASIC chip...aircraft operational environment"; Fig. 4, item 210)

Therefore, claim 41 is rejected under the same rationale as claim 26.

Regarding claim 42:

The rejection of claim 41 is incorporated. Therefore, claim 42 is rejected under the same rationale as claim 41.

Regarding claim 43:

The rejection of claim 41 is incorporated. Claim 43's further limitations are taught in *Richards et al*:

- wherein the control means controls the activation degree of the feature detection element on the basis of a resolution or a scale level (column 25, lines 22-29, "A peripheral register...register load signal 1922")

Therefore, claim 43 is rejected under the same rationale as claim 41.

Regarding claim 44:

The rejection of claim 41 is incorporated. Claim 44's further limitations are taught in *Richards et al*:

- wherein the control means converts or copies a signal of a predetermined resolution or scale into a signal of another resolution or scale level according to a predetermined method, and distributes the resulting signal in a learning mode (column 18, lines 25-36, "Information can be...bit is indicated")

Therefore, claim 44 is rejected under the same rationale as claim 41.

Claims 37-38 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Fukushima* USPN 5,058,184 (October 15, 1991) in view of *Johnson* USPN 5,664,065 (September 2, 1997) in further view of *Iwata et al* USPN 6,088,490 (July 11, 2000 Patent Date; March 25, 1998 Filing Date) in further view of *Richards et al* USPN 6,178,207 (January 23, 2001 Patent Date; January 9, 1998 Filing Date) and in further view of *Carrieri et al* USPN 5,631,469 (May 20, 1997).

Regarding claim 37:

Fukushima teaches,

- input means for inputting a pattern (Fig. 1)

- pattern detecting means that comprises a plurality of signal processing elements and performs detection related to a plurality of predetermined features on a pattern input by the input means so as to detect a predetermined pattern included in the pattern (column 4, lines 58-68, "the neural network...single line showing"; column 5, lines 1-22, "the existence of...in FIG. 2")

- wherein each of the plurality of signal processing elements outputs a signal to another signal processing element or outside in response to an input from the input means or another signal processing element (Figs. 7-14)

- predetermined ones among the plurality of signal processing elements output signals with outputs based on arrival time patterns of a plurality of signals (column 25, lines 34-68, 'FIGS. 16-18 show the...new response thus'; column 26, lines 1-6, 'elicited is shown...of "2" appears")

- the pattern detecting means comprises:

- a plurality of processing means for implementing processing for different resolutions or scale levels on patterns received from the input means (column 25, lines 16-18, "We will now...network is L = 3")

- wherein the plurality of processing means have feature detection layers for detecting features of a predetermined plurality of feature categories (column 5, lines 57-66, "an output response...the input cell-layer")

However, *Fukushima* doesn't explicitly teach outputting a pulse signal, a plurality of pulse signals input within a predetermined time range, processing at different scale levels or resolutions, multiplex processing or sensitivity features approximated by a basis function while *Johnson* teaches,

- wherein each of the plurality of signal processing elements outputs a pulse signal to another signal processing element or outside in response to an input from the input means or another signal processing element (Abstract, "The pulse-coupled automatic...to the segment"; Fig. 1)

Iwata et al teaches,

- predetermined ones among the plurality of signal processing elements output pulse signals with outputs based on arrival time patterns of a plurality of pulse signals input within a predetermined time range (Figs. 1A, 2A, 8B, 9-10, 13A-B; column 13, lines 42-52, "The dynamic range...from easily degrading"; column 6, lines 22-45, "FIG. 7 shows an...high relative accuracy")

Richards et al teaches,

- the pattern detecting means comprises:

- a plurality of processing means for implementing processing for different resolutions or scale levels on patterns received from the input means (column 14, lines 11-60, "The high data rate...time of arrival")

- multiplex processing means for coupling the outputs of the plurality of processing means (Fig. 11, item 1118)

- wherein each of the plurality of processing means comprises a plurality of feature detection elements, as the signal processing elements, that detect and output a plurality of features associated with individual points obtained by sampling the input data according to a predetermined method (column 22, lines 13-49, "the transmit path...and PPM waveforms")

- the multiplex processing means couples the outputs of the plurality of feature detection elements (Fig. 18, items 414, 1830, 1832)

- wherein the plurality of processing means have feature detection layers for detecting features at different resolutions or scale levels on each of a predetermined plurality of feature categories (column 23, lines 43-67, "Timing Adjustment of...faster system clock"; column 24, lines 1-44, "In contrast, with...the system clock")

Carrieri et al teaches,

- wherein the feature detection layer includes a plurality of computing elements having sensitivity features approximated by a basis function that has locally different directional selectivities at different resolutions or scale levels for a feature category to be detected (column 18, lines 22-64, "the neural network filter...on the RBF")

Motivation - The portions of the claimed apparatus would have been a highly desirable feature in this art for

- Good training convergence (*Carrieri et al*, Abstract, "A four-layer neural...known microprocessor chips")
- Accurate detection with flexible data rates (*Richards et al,* Abstract, "An ASIC chip...aircraft operational environment")
- High performance image processing (*Iwata et al*, column 1, lines 62-67, "To solve the...as an image"; column 2, lines 1-5, "figure, etc., compression...images, figures, etc.")
- Reducing transmission in cluttered environments (*Johnson*, column 2, lines 23-58, "the receptive field...in the scene")
- Overcoming noise as well as changes in shape, size and position of the input pattern (*Fukushima*, column 2, lines 12-42, "On the other...a segmentation faculty")

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Fukushima* with *Johnson, Iwata et al, Richards et al* and *Carrieri et al* to obtain the invention specified in claim 37, a pattern detecting apparatus. The modification would have been obvious because one of ordinary skill in the art would have been motivated to efficiently and correctly relate specific patterns in various processing and input environments.

Regarding claim 38:

Fukushima teaches,

- input means for inputting a pattern (Fig. 1)

- pattern detecting means that comprises a plurality of signal processing elements and performs detection related to a plurality of predetermined features on a pattern input by the input means so as to detect a predetermined pattern included in the pattern (column 4, lines 58-68, "the neural network...single line showing"; column 5, lines 1-22, "the existence of...in FIG. 2")

- wherein each of the plurality of signal processing elements outputs a signal to another signal processing element or outside in response to an input from the input means or another signal processing element (Figs. 7-14)

- predetermined ones among the plurality of signal processing elements output signals with outputs based on arrival time patterns of a plurality of signals (column 25, lines 34-68, 'FIGS. 16-18 show the...new response thus'; column 26, lines 1-6, 'elicited is shown...of "2" appears")

- the plurality of signal processing elements comprises:

- a feature detection element that belongs to a feature detection layer for extracting a predetermined feature, and a feature integration element that belongs to a feature integration layer that integrates outputs from the feature detection layer according to a predetermined method and outputs a result of the integration (Fig. 1)

- the predetermined ones among the plurality of signal processing elements are the feature detection elements that receive inputs from a plurality of the feature integration elements (Figs. 7-14)

However, *Fukushima* doesn't explicitly teach outputting a pulse signal, a plurality of pulse signals input within a predetermined time range or the feature detection layer detects a plurality of features for a plurality of resolutions or scale levels for a pattern received from the input means while *Johnson* teaches,

- wherein each of the plurality of signal processing elements outputs a pulse signal to another signal processing element or outside in response to an input from the input means or another signal processing element (Abstract, "The pulse-coupled automatic...to the segment"; Fig. 1)

Iwata et al teaches,

- predetermined ones among the plurality of signal processing elements output pulse signals with outputs based on arrival time patterns of a plurality of pulse signals input within a predetermined time range (Figs. 1A, 2A, 8B, 9-10, 13A-B; column 13, lines 42-52, "The dynamic range...from easily degrading"; column 6, lines 22-45, "FIG. 7 shows an...high relative accuracy")

Richards et al teaches,

- wherein the feature detection layer detects a plurality of features for a plurality of resolutions or scale levels for a pattern received from the input means (column 23, lines 43-67, "Timing Adjustment of...faster system clock"; column 24, lines 1-44, "In contrast, with...the system clock")

Carrieri et al teaches,

- neural networks for scaling data (column 1, lines 57-65, "Known infrared absorption...convergence is attained")

Motivation - The portions of the claimed apparatus would have been a highly desirable feature in this art for

- Good training convergence (*Carrieri et al*, Abstract, "A four-layer neural...known microprocessor chips")
- Accurate detection with flexible data rates (*Richards et al,* Abstract, "An ASIC chip...aircraft operational environment")
- High performance image processing (*Iwata et al*, column 1, lines 62-67, "To solve the...as an image"; column 2, lines 1-5, "figure, etc., compression...images, figures, etc.")
- Reducing transmission in cluttered environments (*Johnson*, column 2, lines 23-58, "the receptive field...in the scene")
- Overcoming noise as well as changes in shape, size and position of the input pattern (*Fukushima*, column 2, lines 12-42, "On the other...a segmentation faculty")

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Fukushima* with *Johnson, Iwata et al, Richards et al* and *Carrieri et al* to obtain the invention specified in claim 38, a pattern detecting apparatus. The modification would have been obvious because one of ordinary skill in

the art would have been motivated to efficiently and correctly relate specific patterns in various processing and input environments.

Regarding claim 40:

The rejection of claim 38 is incorporated. Therefore, claim 40 is rejected under the same rationale as claim 38.

Claims 39 and 45-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Fukushima* USPN 5,058,184 (October 15, 1991) in view of *Johnson* USPN 5,664,065 (September 2, 1997) in further view of *Iwata et al* USPN 6,088,490 (July 11, 2000 Patent Date; March 25, 1998 Filing Date) in further view of *Richards et al* USPN 6,178,207 (January 23, 2001 Patent Date; January 9, 1998 Filing Date) in further view of *Carrieri et al* USPN 5,631,469 (May 20, 1997) and in further view of *Macleod et al* USPN 6,081,660 (June 27, 2000 Patent Date; August 25, 1997 102e/371 Date).

Regarding claim 39:

Fukushima teaches,

- input means for inputting a pattern (Fig. 1)

- pattern detecting means that comprises a plurality of signal processing elements and performs detection related to a plurality of predetermined features on a pattern input by the input means so as to detect a predetermined pattern included in the pattern (column 4, lines 58-68, "the neural network...single line showing"; column 5, lines 1-22, "the existence of...in FIG. 2")

- wherein each of the plurality of signal processing elements outputs a signal to another signal processing element or outside in response to an input from the input means or another signal processing element (Figs. 7-14)

- predetermined ones among the plurality of signal processing elements output signals with outputs based on arrival time patterns of a plurality of signals (column 25, lines 34-68, 'FIGS. 16-18 show the...new response thus'; column 26, lines 1-6, 'elicited is shown...of "2" appears")

- the plurality of signal processing elements comprises:

- a feature detection element that belongs to a feature detection layer for extracting a predetermined feature, and a feature integration element that belongs to a feature integration layer that integrates outputs from the feature detection layer according to a predetermined method and outputs a result of the integration (Fig. 1)

- the predetermined ones among the plurality of signal processing elements are the feature detection elements that receive inputs from a plurality of the feature integration elements (Figs. 7-14)

However, *Fukushima* doesn't explicitly teach outputting a pulse signal, a plurality of pulse signals input within a predetermined time range, the feature detection layer detects a plurality of features for a plurality of resolutions or scale levels for a pattern received from the input means or population coding while *Johnson* teaches,

- wherein each of the plurality of signal processing elements outputs a pulse signal to another signal processing element or outside in response to an input from the input

means or another signal processing element (Abstract, "The pulse-coupled automatic...to the segment"; Fig. 1)

Iwata et al teaches,

- predetermined ones among the plurality of signal processing elements output pulse signals with outputs based on arrival time patterns of a plurality of pulse signals input within a predetermined time range (Figs. 1A, 2A, 8B, 9-10, 13A-B; column 13, lines 42-52, "The dynamic range...from easily degrading"; column 6, lines 22-45, "FIG. 7 shows an...high relative accuracy")

Richards et al teaches,

- wherein the feature detection layer detects a plurality of features for a plurality of resolutions or scale levels for a pattern received from the input means (column 23, lines 43-67, "Timing Adjustment of...faster system clock"; column 24, lines 1-44, "In contrast, with...the system clock")

- wherein the feature integration element comprises an element for sub-sampling feature data in a local receptive field region, and a population coding element for integrating the outputs of the sub-sampling elements that extend over a plurality of resolutions or scale levels (column 22, lines 13-49, "the transmit path...and PPM waveforms")

Carrieri et al teaches,

- neural networks for scaling data (column 1, lines 57-65, "Known infrared absorption...convergence is attained")

Macleod et al teaches,

- wherein the feature integration element comprises an element for sub-sampling feature data in a local receptive field region, and a population coding element for integrating the outputs of the sub-sampling elements that extend over a plurality of resolutions or scale levels (column 2, lines 11-27, "In the comparison...not too great")

Motivation - The portions of the claimed apparatus would have been a highly desirable feature in this art for

- Extending verification coverage (*Macleod et al*, column 2, lines 29-66, "hitherto inexplicable errors...in the cohort")
- Good training convergence (*Carrieri et al*, Abstract, "A four-layer neural...known microprocessor chips")
- Accurate detection with flexible data rates (*Richards et al,* Abstract, "An ASIC chip...aircraft operational environment")
- High performance image processing (*Iwata et al*, column 1, lines 62-67, "To solve the...as an image"; column 2, lines 1-5, "figure, etc., compression...images, figures, etc.")
- Reducing transmission in cluttered environments (*Johnson*, column 2, lines 23-58, "the receptive field...in the scene")
- Overcoming noise as well as changes in shape, size and position of the input pattern (*Fukushima*, column 2, lines 12-42, "On the other...a segmentation faculty")

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Fukushima* with *Johnson, Iwata et al, Richards et al*

Carrieri et al and *Macleod et al* to obtain the invention specified in claim 39, a pattern detecting apparatus. The modification would have been obvious because one of ordinary skill in the art would have been motivated to efficiently and correctly relate specific patterns in various processing and input environments.

Regarding claim 45:

Fukushima teaches,

- input means for inputting a pattern (Fig. 1)

- pattern detecting means that comprises a plurality of signal processing elements and performs detection related to a plurality of predetermined features on a pattern input by the input means so as to detect a predetermined pattern included in the pattern (column 4, lines 58-68, "the neural network...single line showing"; column 5, lines 1-22, "the existence of...in FIG. 2")

- wherein each of the plurality of signal processing elements outputs a signal to another signal processing element or outside in response to an input from the input means or another signal processing element (Figs. 7-14)

- predetermined ones among the plurality of signal processing elements output signals with outputs based on arrival time patterns of a plurality of signals (column 25, lines 34-68, 'FIGS. 16-18 show the...new response thus'; column 26, lines 1-6, 'elicited is shown...of "2" appears")

- the pattern detecting means comprises:

- a plurality of processing means for implementing processing for different resolutions or scale levels on patterns received from the input means (column 25, lines 16-18, "We will now...network is L = 3")

However, *Fukushima* doesn't explicitly teach outputting a pulse signal, a plurality of pulse signals input within a predetermined time range, processing at different scale levels or resolutions or multiplex processing while *Johnson* teaches,

- wherein each of the plurality of signal processing elements outputs a pulse signal to another signal processing element or outside in response to an input from the input means or another signal processing element (Abstract, "The pulse-coupled automatic...to the segment"; Fig. 1)

Iwata et al teaches,

- predetermined ones among the plurality of signal processing elements output pulse signals with outputs based on arrival time patterns of a plurality of pulse signals input within a predetermined time range (Figs. 1A, 2A, 8B, 9-10, 13A-B; column 13, lines 42-52, "The dynamic range...from easily degrading"; column 6, lines 22-45, "FIG. 7 shows an...high relative accuracy")

Richards et al teaches,

- the pattern detecting means comprises:

- a plurality of processing means for implementing processing for different resolutions or scale levels on patterns received from the input means (column 14, lines 11-60, "The high data rate...time of arrival")

- multiplex processing means for coupling the outputs of the plurality of processing means (Fig. 11, item 1118)

- wherein each of the plurality of processing means comprises a plurality of feature detection elements, as the signal processing elements, that detect and output a plurality of features associated with individual points obtained by sampling the input data according to a predetermined method (column 22, lines 13-49, "the transmit path...and PPM waveforms")

- the multiplex processing means couples the outputs of the plurality of feature detection elements (Fig. 18, items 414, 1830, 1832)

Carrieri et al teaches,

- neural networks for scaling data (column 1, lines 57-65, "Known infrared absorption...convergence is attained")

- the plurality of processing means comprises a plurality of channels that individually implement processing at different scale levels or resolutions by employing groups of neurons having hierarchical structures (Abstract, "A four-layer neural...known microprocessor chips"; column 8, lines 25-44, "The network is...per input PE")

- the multiplexing means comprises a group of population coding neurons that integrate outputs of a plurality of channels (Abstract, "A four-layer neural...known microprocessor chips"; column 8, lines 25-44, "The network is...per input PE")

Macleod et al teaches,

- wherein the feature integration element comprises a population coding element for integrating the outputs (column 2, lines 11-27, "In the comparison...not too great")

Motivation - The portions of the claimed apparatus would have been a highly desirable feature in this art for

- Extending verification coverage (*Macleod et al*, column 2, lines 29-66, "hitherto inexplicable errors...in the cohort")
- Good training convergence (*Carrieri et al*, Abstract, "A four-layer neural...known microprocessor chips")
- Accurate detection with flexible data rates (*Richards et al,* Abstract, "An ASIC chip...aircraft operational environment")
- High performance image processing (*Iwata et al*, column 1, lines 62-67, "To solve the...as an image"; column 2, lines 1-5, "figure, etc., compression...images, figures, etc.")
- Reducing transmission in cluttered environments (*Johnson*, column 2, lines 23-58, "the receptive field...in the scene")
- Overcoming noise as well as changes in shape, size and position of the input pattern (*Fukushima*, column 2, lines 12-42, "On the other...a segmentation faculty")

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Fukushima* with *Johnson, Iwata et al* and *Richards et al* to obtain the invention specified in claim 45, a pattern detecting apparatus. The modification would have been obvious because one of ordinary skill in the art would have been motivated to efficiently and correctly relate specific patterns in various processing and input environments.

Regarding claim 46:

The rejection of claim 45 is incorporated. Therefore, claim 46 is rejected under the same rationale as claim 45.

Regarding claim 47:

The rejection of claim 45 is incorporated. Therefore, claim 47 is rejected under the same rationale as claim 45.

Claims 48-50 and 54-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Fukushima* USPN 5,058,184 (October 15, 1991) in view of *Johnson* USPN 5,664,065 (September 2, 1997) in further view of *Iwata et al* USPN 6,088,490 (July 11, 2000 Patent Date; March 25, 1998 Filing Date) in further view of *Richards et al* USPN 6,178,207 (January 23, 2001 Patent Date; January 9, 1998 Filing Date) and in further view of *Moore et al* "The Implementation of a Multi-View Autostereoscopic Display" (October 15, 1992).

Regarding claim 48:

Fukushima teaches,

- input means for inputting a pattern (Fig. 1)

- pattern detecting means that comprises a plurality of signal processing elements and performs detection related to a plurality of predetermined features on a pattern input by the input means so as to detect a predetermined pattern included in the pattern (column 4, lines 58-68, "the neural network...single line showing"; column 5, lines 1-22, "the existence of...in FIG. 2")

- wherein each of the plurality of signal processing elements outputs a signal to another signal processing element or outside in response to an input from the input means or another signal processing element (Figs. 7-14)

- predetermined ones among the plurality of signal processing elements output signals with outputs based on arrival time patterns of a plurality of signals (column 25, lines 34-68, 'FIGS. 16-18 show the...new response thus'; column 26, lines 1-6, 'elicited is shown...of "2" appears")

However, *Fukushima* doesn't explicitly teach outputting a pulse signal or a plurality of pulse signals input within a predetermined time range, sampling or fixation region setting control while *Johnson* teaches,

- wherein each of the plurality of signal processing elements outputs a pulse signal to another signal processing element or outside in response to an input from the input means or another signal processing element (Abstract, "The pulse-coupled automatic...to the segment"; Fig. 1)

Iwata et al teaches,

- predetermined ones among the plurality of signal processing elements output pulse signals with outputs based on arrival time patterns of a plurality of pulse signals input within a predetermined time range (Figs. 1A, 2A, 8B, 9-10, 13A-B; column 13, lines 42-52, "The dynamic range...from easily degrading"; column 6, lines 22-45, "FIG. 7 shows an...high relative accuracy")

Richards et al teaches,

- the plurality of feature detection elements in a plurality of hierarchies for detecting a plurality of features in correspondence with points obtained by sampling the patterns received from the input means according to a predetermined method (column 22, lines 13-49, "the transmit path...and PPM waveforms")

Moore et al teaches,

- fixation region setting control means for controlling the setting of a fixation region associated with an output of a lower layer of the plurality of hierarchies on the basis of the distributions of feedback signals from an upper layer of the plurality of hierarchies (page 4/1, paragraphs 1-3, "A novel autostereoscopic...suitable signal source")

Motivation - The portions of the claimed apparatus would have been a highly desirable feature in this art for

- Simplified optical system implementation (*Moore et al*, page 4/1, paragraphs 4-6, "The advantage of...for all views")
- Accurate detection with flexible data rates (*Richards et al,* Abstract, "An ASIC chip...aircraft operational environment")
- High performance image processing (*Iwata et al*, column 1, lines 62-67, "To solve the...as an image"; column 2, lines 1-5, "figure, etc., compression...images, figures, etc.")
- Reducing transmission in cluttered environments (*Johnson*, column 2, lines 23-58, "the receptive field...in the scene")

- Overcoming noise as well as changes in shape, size and position of the input pattern (*Fukushima*, column 2, lines 12-42, "On the other... a segmentation faculty")

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Fukushima* with *Johnson, Iwata et al, Richards et al* and *Moore et al* to obtain the invention specified in claim 48, a pattern detecting apparatus. The modification would have been obvious because one of ordinary skill in the art would have been motivated to efficiently, simply and correctly relate specific patterns in various processing and input environments.

Regarding claim 49:

The rejection of claim 48 is incorporated. Claim 49's further limitations are taught in *Moore et al*:

- wherein the fixation region setting control means updates a set position or size of a fixation region (Figs. 2-4)

Therefore, claim 49 is rejected under the same rationale as claim 48.

Regarding claim 50:

The rejection of claim 48 is incorporated. Claim 50's further limitations are taught in *Fukushima*:

- the pattern detecting means comprises salience detecting elements for detecting the salience of features and a coupling means for coupling the elements and transmitting signals, and forms a plurality of element layers for low-order to high-order features (Fig. 1)

- the connecting means comprises feedback connecting means for transmitting signals from an element layer for a high-order feature to an element layer for a feature of a lower order (Figs. 11-12)

Moore et al:

- the fixation region setting control means controls the setting of a fixation region for low-order feature data or input data on the basis of the feature salience level and a signal transmission amount obtained by the feedback connecting means (Figs. 2-4; page 4/10, section 5.1, first paragraph, "The signals to...μSecs to settle")

Therefore, claim 50 is rejected under the same rationale as claim 48.

Regarding claim 54:

The rejection of claim 50 is incorporated. Claim 54's further limitations are taught in *Fukushima*:

- wherein the fixation region setting control means controls the setting of a fixation region as an active receptive field of a feature detection element that belongs to a low-order feature detection layer (column 17, lines 12-36, "the density of...pattern, are extracted")

Therefore, claim 54 is rejected under the same rationale as claim 50.

Regarding claim 55:

The rejection of claim 50 is incorporated. Claim 55's further limitations are taught in *Fukushima*:

- wherein the fixation region setting control means receives a feedback connection from an upper layer that outputs information regarding the position of an object that belongs

to the category to be recognized and regarding a probability of existence, and a feedback connection from an intermediate layer that outputs information regarding the position of a medium-order feature of an object of a category to be recognized and regarding a probability of existence, and gives priority to a feedback input from the upper layer when searching for the object, or to a feedback input from the intermediate layer when recognizing the object (column 8, lines 24-39, "only a part...can be realized")

Therefore, claim 55 is rejected under the same rationale as claim 50.

Regarding claim 56:

The rejection of claim 50 is incorporated. Claim 56's further limitations are taught in *Moore et al*:

- wherein the fixation region setting control means reduces a temporal change in the central position of a fixation region when a predetermined degree of gaze is high (page 4/8, section 4.1.1, "The human eyes...and 16 of 1°")

Therefore, claim 56 is rejected under the same rationale as claim 50.

Regarding claim 57:

The rejection of claim 55 is incorporated. Claim 57's further limitations are taught in *Fukushima*:

- wherein the degree of attention takes a monotone increase function value of a feedback signal level from the upper layer (column 18, lines 28-68, "The inhibitory cell...is also activated")

Therefore, claim 57 is rejected under the same rationale as claim 55.

Regarding claim 58:

Fukushima teaches,

- input means for inputting a pattern (Fig. 1)

- pattern detecting means that comprises a plurality of signal processing elements and performs detection related to a plurality of predetermined features on a pattern input by the input means so as to detect a predetermined pattern included in the pattern (column 4, lines 58-68, "the neural network...single line showing"; column 5, lines 1-22, "the existence of...in FIG. 2")

- wherein each of the plurality of signal processing elements outputs a signal to another signal processing element or outside in response to an input from the input means or another signal processing element (Figs. 7-14)

- predetermined ones among the plurality of signal processing elements output signals with outputs based on arrival time patterns of a plurality of signals (column 25, lines 34-68, 'FIGS. 16-18 show the...new response thus'; column 26, lines 1-6, 'elicited is shown...of "2" appears")

- the plurality of signal processing elements comprises:

- a feature detection element that belongs to a feature detection layer for extracting a predetermined feature, and a feature integration element that belongs to a feature integration layer that integrates outputs from the feature detection layer according to a predetermined method and outputs a result of the integration (Fig. 1)

- the predetermined ones among the plurality of signal processing elements are the feature detection elements that receive inputs from a plurality of the feature integration elements (Figs. 7-12)

- feedback connecting means for transmitting signals from an upper layer to a lower layer in a hierarchical network structure combining the feature detection layers and the feature integration layers (Figs. 1, 7-12)

- the feature detection layer or the feature integration layer comprises a salience detecting element for detecting the salience of a feature (Fig. 14, item 64; Fig. 14, item 70)

However, *Fukushima* doesn't explicitly teach outputting a pulse signal, a plurality of pulse signals input within a predetermined time range, the feature detection layer extracts a plurality of features of reach of a plurality of resolutions or scale levels or fixation region setting control means that issues control signals related to a fixation region on the basis of a signal from the feedback connecting means and the salience level of a feature while *Johnson* teaches,

- wherein each of the plurality of signal processing elements outputs a pulse signal to another signal processing element or outside in response to an input from the input means or another signal processing element (Abstract, "The pulse-coupled automatic...to the segment"; Fig. 1)

Iwata et al teaches,

- predetermined ones among the plurality of signal processing elements output pulse signals with outputs based on arrival time patterns of a plurality of pulse signals input

within a predetermined time range (Figs. 1A, 2A, 8B, 9-10, 13A-B; column 13, lines 42-52, "The dynamic range...from easily degrading"; column 6, lines 22-45, "FIG. 7 shows an...high relative accuracy")

Richards et al teaches,

- wherein the feature detection layer extracts a plurality of features of reach of a plurality of resolutions or scale levels (column 14, lines 11-60, "The high data rate...time of arrival

Moore et al teaches,

- fixation region setting control means that issues control signals related to a fixation region on the basis of a signal from the feedback connecting means and the salience level of a feature (page 4/1, paragraphs 1-3, "A novel autostereoscopic...suitable signal source"; page 4/10, section 5.1, "The signals to...for the display")

Motivation - The portions of the claimed apparatus would have been a highly desirable feature in this art for

- Simplified optical system implementation (*Moore et al*, page 4/1, paragraphs 4-6, "The advantage of...for all views")
- Accurate detection with flexible data rates (*Richards et al,* Abstract, "An ASIC chip...aircraft operational environment")
- High performance image processing (*Iwata et al*, column 1, lines 62-67, "To solve the...as an image"; column 2, lines 1-5, "figure, etc., compression...images, figures, etc.")

- Reducing transmission in cluttered environments (*Johnson*, column 2, lines 23-58, "the receptive field...in the scene")
- Overcoming noise as well as changes in shape, size and position of the input pattern (*Fukushima*, column 2, lines 12-42, "On the other...a segmentation faculty")

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Fukushima* with *Johnson, Iwata et al, Richards et al* and *Moore et al* to obtain the invention specified in claim 58, a pattern detecting apparatus. The modification would have been obvious because one of ordinary skill in the art would have been motivated to efficiently, simply and correctly relate specific patterns in various processing and input environments.

Regarding claim 59:

The rejection of claim 58 is incorporated. Claim 59's further limitations are taught in *Fukushima*:

- wherein the fixation region setting control means sets the size of a fixation region on the basis of a detected scale level associated with the pattern that belongs to a category to be recognized (column 4, lines 38-47, "A human being...a human being"; column 17, lines 43-55, "in the afferent ... the stimulus pattern")

Therefore, claim 59 is rejected under the same rationale as claim 58.

Regarding claim 60:

The rejection of claim 49 is incorporated. Claim 60's further limitations are taught in *Moore et al*:

- fixation region setting means for setting a fixation region (page 4/10, section 5.1, paragraph 5, "The PC acts...for the display")

- determining means for determining photographing conditions on the basis of a fixation region set by the fixation region setting means (page 4/8, paragraph 3, "The slot shutter...have high brightness"; page 4/9, section 4.1.3, "Sequential views are...transmission Contrast Ratio")

- memory means for storing model data regarding an object to be photographed (page 4/10, section 5.1, paragraph 4, "The DRAM holds...give moving pictures")

- wherein the fixation region setting means sequentially updates a fixation region to search for a fixation region that meets a predetermined requirement regarding the model data thereby to set the fixation region under the control by the fixation region setting control means of the pattern detecting apparatus according to Claim 49 (page 4/10, section 5.1, paragraphs 1-3, "The signals to...on the card")

Therefore, claim 60 is rejected under the same rationale as claim 49.

Regarding claim 61:

The rejection of claim 60 is incorporated. Claim 61's further limitations are taught in *Fukushima*:

- initializing means for initializing a fixation region in a photographic standby state (column 21, lines 2-11, "The positive constant...and Kandel 1976"; column 22, lines 11-23, "the efficiency of...should exists there")

Therefore, claim 61 is rejected under the same rationale as claim 60.

Regarding claim 62:

The rejection of claim 60 is incorporated. Therefore, claim 62 is rejected under the same rationale as claim 60.

Regarding claim 63:

The rejection of claim 60 is incorporated. Therefore, claim 63 is rejected under the same rationale as claim 60.

Regarding claim 64:

The rejection of claim 49 is incorporated. Claim 64's further limitations are taught in *Moore et al*:

- fixation region setting means for setting a fixation region (page 4/10, section 5.1, paragraph 5, "The PC acts...for the display")

- determining means for determining photographing conditions on the basis of a fixation region set by the fixation region setting means (page 4/8, paragraph 3, "The slot shutter...have high brightness"; page 4/9, section 4.1.3, "Sequential views are...transmission Contrast Ratio")

- fixation position detecting means for detecting a fixation position on the basis of a user's visual axis (page 4/1, paragraph 3, "The display described...suitable signal source")

- wherein the fixation region setting means searches for and sets a fixation region on the basis of the fixation position under the control by the fixation region setting control means of the pattern detecting apparatus according to Claim 49 (page 4/10, section 5.1, paragraphs 1-3, "The signals to...on the card")

Therefore, claim 64 is rejected under the same rationale as claim 49.

Regarding claim 65:

The rejection of claim 64 is incorporated. Therefore, claim 65 is rejected under the same rationale as claim 64.

Claims 51-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Fukushima* USPN 5,058,184 (October 15, 1991) in view of *Johnson* USPN 5,664,065 (September 2, 1997) in further view of *Iwata et al* USPN 6,088,490 (July 11, 2000 Patent Date; March 25, 1998 Filing Date) in further view of *Richards et al* USPN 6,178,207 (January 23, 2001 Patent Date; January 9, 1998 Filing Date) in further view of *Warren et al* USPN 4,577,344 (March 18, 1986) and further in view of *Moore et al* "The Implementation of a Multi-View Autostereoscopic Display" (October 15, 1992).

Regarding claim 51:

Fukushima teaches,

- input means for inputting a pattern (Fig. 1)

- pattern detecting means that comprises a plurality of signal processing elements and performs detection related to a plurality of predetermined features on a pattern input by the input means so as to detect a predetermined pattern included in the pattern (column 4, lines 58-68, "the neural network...single line showing"; column 5, lines 1-22, "the existence of...in FIG. 2")

- wherein each of the plurality of signal processing elements outputs a signal to another signal processing element or outside in response to an input from the input means or another signal processing element (Figs. 7-14)

- predetermined ones among the plurality of signal processing elements output signals with outputs based on arrival time patterns of a plurality of signals (column 25, lines 34-68, 'FIGS. 16-18 show the...new response thus'; column 26, lines 1-6, 'elicited is shown...of "2" appears")

- the pattern detecting means comprises salience detecting elements for detecting the salience of features and a coupling means for coupling the elements and transmitting signals, and forms a plurality of element layers for low-order to high-order features (Fig. 1)

- the connecting means comprises feedback connecting means for transmitting signals from an element layer for a high-order feature to an element layer for a feature of a lower order (Figs. 11-12)

- priority level calculating means for determining the priority level of a fixation positions at sampling points of each piece of input data on the basis of a signal transmission amount received from the feedback connecting means and the salience level of a low-order feature (column 24, lines 24-39, "The influence of...more features simultaneously")

- fixation position setting means for setting fixation positions in a descending order of priority levels on the basis of a distribution of priority levels (column 23, lines 61-66, "The situation in ... of all stages")

However, *Fukushima* doesn't explicitly teach outputting a pulse signal or a plurality of pulse signals input within a predetermined time range, sampling, fixation region setting control or priority levels while *Johnson* teaches,

- wherein each of the plurality of signal processing elements outputs a pulse signal to another signal processing element or outside in response to an input from the input means or another signal processing element (Abstract, "The pulse-coupled automatic...to the segment"; Fig. 1)

Iwata et al teaches,

- predetermined ones among the plurality of signal processing elements output pulse signals with outputs based on arrival time patterns of a plurality of pulse signals input within a predetermined time range (Figs. 1A, 2A, 8B, 9-10, 13A-B; column 13, lines 42-52, "The dynamic range...from easily degrading"; column 6, lines 22-45, "FIG. 7 shows an...high relative accuracy")

Richards et al teaches,

- the plurality of feature detection elements in a plurality of hierarchies for detecting a plurality of features in correspondence with points obtained by sampling the patterns received from the input means according to a predetermined method (column 22, lines 13-49, "the transmit path...and PPM waveforms")

Moore et al teaches,

- the fixation region setting control means controls the setting of a fixation region for low-order feature data or input data on the basis of the feature salience level and a signal

transmission amount obtained by the feedback connecting means (Figs. 2-4; page 4/10, section 5.1, first paragraph, "The signals to...μSecs to settle")

- fixation region setting control means for controlling the setting of a fixation region associated with an output of a lower layer of the plurality of hierarchies on the basis of the distributions of feedback signals from an upper layer of the plurality of hierarchies (page 4/1, paragraphs 1-3, "A novel autostereoscopic...suitable signal source")

Warren et al teaches,

- priority level calculating means for determining the priority level of a fixation positions at sampling points of each piece of input data on the basis of a signal transmission amount received from the feedback connecting means and the salience level of a low-order feature (column 6, lines 17-29, "Bus register 134 allows...when timer 130 is active")

Motivation - The portions of the claimed apparatus would have been a highly desirable feature in this art for

- Interleaving memory-to-memory transfers without conflict or sacrificing performance (*Warren et al*, column 6, lines 29-36, "Timer 130 allows computer...master request bus 40")
- Simplified optical system implementation (*Moore et al*, page 4/1, paragraphs 4-6, "The advantage of...for all views")
- Accurate detection with flexible data rates (*Richards et al,* Abstract, "An ASIC chip...aircraft operational environment")

- High performance image processing (*Iwata et al*, column 1, lines 62-67, "To solve the...as an image"; column 2, lines 1-5, "figure, etc., compression...images, figures, etc.")
- Reducing transmission in cluttered environments (*Johnson*, column 2, lines 23-58, "the receptive field...in the scene")
- Overcoming noise as well as changes in shape, size and position of the input pattern (*Fukushima*, column 2, lines 12-42, "On the other...a segmentation faculty")

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to combine *Fukushima* with *Johnson, Iwata et al, Richards et al* and *Moore et al* to obtain the invention specified in claim 51, a pattern detecting apparatus. The modification would have been obvious because one of ordinary skill in the art would have been motivated to efficiently, simply and correctly relate specific patterns in various processing and input environments.

Regarding claim 52:

The rejection of claim 51 is incorporated. Claim 52's further limitations are taught in *Richards et al*:

- counting means for counting the number of searches for fixation positions (column 3, lines 8-32, "In another aspect...high speed sampling"; column 8, lines 47-57, "The receive data...from the down-converter 222")

- control means for controlling a permissible range of priority levels wherein fixation positions can be set by the fixation position setting means on the basis of the number of searches for fixation positions (Fig. 4, item 210)

Therefore, claim 52 is rejected under the same rationale as claim 51.

Regarding claim 53:

The rejection of claim 51 is incorporated. Claim 53's further limitations are taught in *Richards et al*:

- the detecting means comprises a plurality of processing channels associated with a plurality of scale levels or resolutions (column 7, lines 56-67, "The processor interface... transmit data path 512")

- the fixation region setting control means controls the size of a fixation region on the basis of the processing channel to which a feature selected based on the priority level belongs (column 18, lines 23-36, "Information can be ... bit is indicated")

Therefore, claim 53 is rejected under the same rationale as claim 51.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- *Allen et al*; US 5268684 A; Apparatus for a neural network one-out-of-N encoder/decoder

- *Iwata et al*; US 6088490 A; Apparatus for processing two-dimensional information

- *Fukushima*; US 5058184 A; Hierachical information processing system

- *Mead et al*; US 5049758 A; Adaptable CMOS winner-take all circuit

- *Loris et al*; US 4876731 A; Neural network model in pattern recognition using probabilistic contextual information

- *Johnson*; US 5664065 A; Pulse-coupled automatic object recognition system dedicatory clause

- *Richards et al*; US 6178207 B1; Aircraft combat training signal processing system

- *Carrieri et al*; US 5631469 A; Neural network computing system for pattern recognition of thermoluminescence signature spectra and chemical defense

- *Sun et al*; US 6678389 B1; Method and apparatus for embedding digital information in digital multimedia data

- *Wang*; US 5594834 A; Method and system for recognizing a boundary between sounds in continuous speech

- *Jedwab et al*; US 6373859 B1; Methods and apparatus for encoding and decoding data

- *Macleod et al*; US 6081660 A; Method for forming a cohort for use in identification of an individual

- *Warren et al*; US 4577344 A; Vision system

- *Matsugu et al*; US 2003/0044073 A1; Image Recognition/Reproduction Method and Apparatus

- *Kondo et al*; US 6654497 B1; Image Processing Apparatus, Method and Storage Medium

- *Moore et al*; The implementation of a multi-view autostereoscopic display; Stereoscopic Television, IEE Colloquium on; 15 Oct 1992; pp 4/1-416

- *Yonemoto et al*; A 2 million pixel FIT-CCD image sensor for HDTV camera system; Solid-State Circuits Conference. Digest of Technical Papers. 37th ISSCC; 1990 IEEE International; 14-16 Feb. 1990; pp 214-215, 299

- *Matsugu et al*; Estimation Of Information Capacity In Oscillatory Neural Networks; Neural Networks, Proceedings of 1993 International Joint Conference on; Vol. 1; October 25-29, 1993; pp 425-428

- *Schneider et al*; Parallel pattern recognition using fuzzy cooperative expert systems; Proceedings of the 1992 ACM/SIGAPP Symposium on Applied computing: technological challenges of the 1990's; April 1992

Any inquiry concerning this communication or earlier communications from the Office should be directed to Meltin Bell whose telephone number is 703-305-0362. This Examiner can normally be reached on Mon - Fri 7:30 am - 4:30 pm.

If attempts to reach this Examiner by telephone are unsuccessful, his supervisor, Anil Khatri, can be reached on 703-305-0282. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

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MB / AMK,